

**AMENDMENTS TO THE CLAIMS**

*Please amend the claims as follows:*

- 1). (Previously amended) A method, comprising:  
  
analyzing each routine, of a software program having a plurality of separately compilable routines, to create a plurality of local side-effect lattice problems for each routine; and  
  
merging the local side-effect lattice problems to create a global side-effect problem.
- 2). (Previously amended) The method of claim 1, further comprising:  
  
computing a global solution to the global lattice problem; and  
  
splitting the global solution into local solutions.
- 3). (Currently amended) The method of claim 2, further comprising:  
  
determining, for each routine, whether a pointer parameter within the routine is used to write to or read from a storage device.
- 4). (Original) The method of claim 3, further comprising:  
  
determining for each routine whether the pointer parameter is used to derive a return value of the routine.
- 5). (Previously amended) The method of claim 4, further comprising:  
  
computing a lattice value associated with each of the pointer parameters, wherein the lattice value comprises one or more of a return, write, and read effect.

- 6). (Original) The method of claim 5, further comprising:  
providing the lattice values to an interprocedural analysis solver to optimize compilation of the software program.
- 7). (Previously amended) The method of claim 6, further comprising:  
representing the local side-effect lattice problems as directed graphs having edges and vertices, wherein  
each edge has an associated monotone transfer function;  
each vertex has a vertex value, wherein the vertex value is one of formal parameter, implicit parameter, local pointer variable, or gate parameter; and  
a subset of the vertices is marked with the lattice values.
- 8). (Previously amended) A computer-readable medium having stored thereon a plurality of instructions, said plurality of instructions when executed by a computer, cause said computer to perform:  
analyzing each routine, of a software program having a plurality of separately compilable routines, to create a plurality of local side-effect lattice problems for each routine; and  
merging the local side-effect lattice problems to create a global side-effect problem.
- 9). (Previously amended) The computer-readable medium of claim 8 having stored thereon additional instructions, said additional instructions when executed by a computer, cause said computer to further perform:

computing a global side-effect lattice solution to the global side-effect lattice problem; and

splitting the global side-effect lattice solution into local side-effect solutions.

10). (Currently amended) The computer-readable medium of claim 9 having stored thereon additional instructions, said additional instructions when executed by a computer, cause said computer to further perform:

determining, for each routine, whether a pointer parameter within the routine is used to write to or read from a storage device.

11). (Original) The computer-readable medium of claim 10 having stored thereon additional instructions, said additional instructions when executed by a computer, cause said computer to further perform:

determining for each routine whether the pointer parameter is used to derive a return value of the routine.

12). (Previously amended) The computer-readable medium of claim 11 having stored thereon additional instructions, said additional instructions when executed by a computer, cause said computer to further perform,

computing a lattice value associated with each of the pointer parameters, wherein the lattice value comprises one or more of a return, write, and read effect.

13). (Original) The computer-readable medium of claim 12 having stored thereon additional instructions, said additional instructions when executed by a computer, cause said computer to further perform:

providing the lattice values to an interprocedural analysis solver to optimize compilation of the software program.

14). (Previously amended) The computer-readable medium of claim 13 having stored thereon additional instructions, said additional instructions when executed by a computer, cause said computer to further perform:

representing the local side-effect lattice problems as directed graphs having edges and vertices, wherein

each edge has an associated monotone transfer function;

each vertex has a vertex value, wherein the vertex value is one of formal parameter, implicit parameter, local pointer variable, or gate parameter; and

a subset of the vertices is marked with the lattice values.

15). (Currently amended) A system, comprising:

a processor;

a memory connected to the processor storing instructions for interprocedural side-effect analysis executed by the processor; and

a storage connected to the processor that stores a software program having a plurality of separately compilable routines[[.]] ;

wherein the processor analyzes each routine, of the software program, to create a plurality of local side-effect lattice problems for each routine; and

wherein the processor merges the local side-effect lattice problems to create a global side-effect lattice problem.

- 16). (Previously amended) The system of claim 15, wherein the processor computes a global solution to the global lattice problem; and splits the global solution into local solutions.
- 17). (Original) The system of claim 16, wherein the processor determines for each routine, whether a pointer parameter within the routine is used to write to or read from the storage device.
- 18). (Original) The system of claim 17, wherein the processor determines for each routine whether the pointer parameter is used to derive a return value of the routine.
- 19). (Previously amended) The system of claim 18, wherein the processor:  
computes a lattice value associated with each of the pointer parameters, wherein the lattice value comprises one or more of a return, write, and read effect.
- 20). (Original) The system of claim 19, wherein the processor:  
provides the lattice values to an interprocedural analysis solver to optimize compilation of the software program.
- 21). (Previously amended) The system of claim 20, wherein the processor:  
represents the local side-effect lattice problems as directed graphs having edges and vertices, wherein  
each edge has an associated monotone transfer function;  
each vertex has a vertex value, wherein the vertex value is one of a formal parameter, implicit parameter, local pointer variable, or gate parameter; and  
a subset of the vertices is marked with the lattice values.